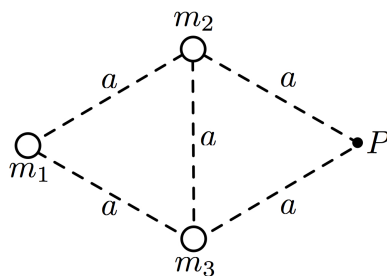## Problem Set 1
Due January 21

In the figure below, three point particles are fixed in place in the xy plane. The three partiles sit on the corners of an equilateral triangle with sides of length $a = 2.50$ mm. Particle 1 has a mass $m_1 = 12.0$ kg, particle 2 has a mass $m_2 = 18.0$ kg, and particle 3 has a mass $m_3 = 15.0$ kg.

Use the particles described in the figure above to answer the following questions.

1. What is the magnitude and direction of the net gravitational force exerted on particle 1 by the other two particles?

2. What is the magnitude and direction of the gravitational field at point P shown on the figure?

3. How much work would you have to do to move particle 3 to point P?

4. Suppose you fixed particle 3 at its new position at point P. If you released a fourth particle with a mass of $m_4 = 40.0$ kg from infinitely far away, how fast would it be going when it reached the place where particle 3 had initally been positioned?